SNC2D Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 2 – Light & Geometric Optics Review**

**Chapter 10 – Light and Reflection**

*I know how to use & distinguish between the following terms:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| incandescence | fluorescence | luminescence | phosphorescence | chemiluminescence |
| bioluminescence | wavelength | reflection | medium | ray |
| incident ray | angle of incidence | normal | reflected ray | angle of reflection |
| plane mirror | virtual image | concave mirror | principal axis | vertex (V) |
| focal point (F) | focal length | real image | spherical aberration | |
| magnification | convex mirror |  |  | |

*I know how to…*

\_\_ distinguish between natural and artificial light sources

\_\_ explain how light is produced by the Sun, incandescent light bulbs, electric discharge, fluorescent

light bulbs

\_\_ distinguish between fluorescence, luminescence, and phosphorescence

\_\_ distinguish between & give examples of chemiluminescence & bioluminescence

\_\_ use the electromagnetic spectrum (See Figure 10.11, page 409] to determine the wavelengths &

frequencies of various types of electromagnetic waves

\_\_ draw a labelled ray diagram for light reflecting off a smooth surface [See Fig.10.14, p.413]

\_\_ state the laws of reflection

\_\_ predict the 4 characteristics of an image using a ray diagram [See Table 10.1, p.416]

\_\_ draw ray diagrams for concave mirrors & predict the characteristics of the image

[See Table 10.2, p.422; Table 10.3, p.423; Table 10.4, p.424]

\_\_ use the mirror & magnification equations to calculate unknown quantities [See Sample & Practice

Problems, p.426-427 & p.435-436]

\_\_ explain what causes spherical aberration in concave mirrors

\_\_ explain how radar techonology works [See Fig.10.23, p.429]; how typical airplanes are detected by

radar [See Fig.10.29, p.437]: and how stealth aircraft avoid detection by radar [Fig.10.17, p.417]

\_\_ draw ray diagrams for convex mirrors & predict the characteristics of the image

[See Table 10.5, p.433]

\_\_ describe how convex mirrors are used in convenience stores, parking lots, and border crossings

**Chapter 11 – Refraction**

*I know how to use & distinguish between the following terms:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| refraction | refracted ray | angle of refraction | index of refraction | dispersion |
| partial reflection and refraction | | critical angle | total internal reflection | |
| rainbow | apparent depth | shimmering | mirage |  |

*I know how to…*

\_\_ explain refraction of light using Fermat’s principle [See Fig.11.5, p.451]

\_\_ predict the direction of a refracted ray based on refraction index [See question 4, p.455]

\_\_ draw a ray diagram that shows an incident ray travelling through 2 media with different indices of

refraction [See Fig.11.6, p.451]

\_\_ use the formula n = c/v to determine unknown quantities [See Sample & Practice Problems,

p.455]

\_\_ predict the order of colours of light when white light is dispersed [See Fig.11.8, p.453]

\_\_ explain how light is refracted & reflected in a rearview mirror in the daytime & nighttime settings

[See Fig.11.13, p.460]

\_\_ predict relative amounts of reflection & refraction depending on angle of incidence

\_\_ describe the conditions for total internal reflection [See Fig.11.14, p.461]

\_\_ predict the change in direction of a light ray that enters a glass prism [See Fig.11.17, p.464]

\_\_ using the principles of refraction and reflection, explain how retroreflectors and optical fibres work

[See Fig.11.19 & 11.20, p.465]

\_\_ explain how a rainbow & secondary rainbow& sundogs are formed [See Fig.11.24, p.469]

\_\_ explain what causes the illusion of apparent depth [See Fig.11.25, p.470], shimmering

[Fig.11.27, p.471], and mirage [Fig.11.28, p.473]

**Chapter 12 – Characteristics of Lenses**

*I know how to use & distinguish between the following terms:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| lens | converging lenses | diverging lenses | chromatic aberration | |
| objective lens | eyepiece | cornea | retina | myopia |
| hyperopia | presbyopia | astigmatism | night-vision device |  |

*I know how to…*

\_\_ distinguish between convex and concave lenses [See Fig.12.3, p.488]

\_\_ draw ray diagrams to illustrate how rays parallel to the principal axis emerge in converging &

diverging lenses [See Figure 12.6, p.490]

\_\_ describe how the size of curvature relates to the focal length [See Fig.12.7, p.490]

\_\_ explain the cause of spherical & chromatic aberration in lenses [See Fig.12.9, p.492]

\_\_ draw ray diagrams for converging lenses & predict the characteristics of the image

[See Table 12.1, p.495; Figure 12.12, p.496]

\_\_ draw ray diagrams for diverging lenses & predict the characteristics of the image

[See Table 12.2, p.497]

\_\_ use the thin lens equation & magnification equation to calculate unknown quantities for

converging lenses & diverging lenses [See Sample & Practice Problems, p.499-500 & Lens

Problems worksheet]

\_\_ identify the ways in which the properties of mirrors & lenses are used to generate images in

refracting telescopes, reflecting telescopes, binoculars, and microscopes

\*You don’t need to know how to draw the ray diagrams for these devices.\*

\_\_ distinguish between how a camera & the human eye generate images

\_\_ describe how corrective lenses are used to correct for myopia, hyperopia, and presbyopia